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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF OREGON
PORTLAND DIVISION

Rocky Bixby, *et al.*,

Plaintiffs,

v.

KBR, Inc., *et al.*,

Defendants.

Case No. 3:09-cv-632-PK

Memorandum in Opposition to KBR's
Motion to Exclude Dr. Arch Carson's
Testimony re Causation

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Introduction and Summary of the Response

This Court should deny KBR's Motion to Exclude Dr. Arch Carson's Testimony re Causation because Dr. Carson's opinions satisfy the standard of admissibility set forth by *Daubert* and its progeny. KBR's challenge of Dr. Carson's opinion is contradicted by the record, ignores applicable law, and goes to the weight rather than the admissibility of Dr. Carson's opinion.

Standard of Review

Rule 702 of the Federal Rules of Evidence provides that a witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) The expert's scientific, technical, or other specialized knowledge will help the trier of fact to determine a fact in issue;
- (b) The testimony is based on sufficient facts or data;
- (c) The testimony is the product of reliable principles and methods; and,
- (d) The expert has reliably applied the principles and methods to the facts of the case.

Daubert v. Merrell Dow Pharm. Inc., 509 U.S. 579 (1993). The party seeking to admit expert testimony has the burden of proving that it satisfies the requirements of Rule 702. *Id.* at 592 n. 10.

A proper *Daubert* inquiry is a flexible one and requires the court to examine methodologies as applied to the specific facts of the case rather than a cookie-cutter application of potentially inapplicable rules. *McCellan v. I-Flow Corp.*, 710 F.Supp. 2d 1092, 1106 (D. Or. 2010); *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 150 (1999). Consistent with *Daubert's* flexibility, the Comment to Rule 702 provides

that “[a] review of the case law after *Daubert* shows that the rejection of expert testimony is the exception rather than the rule.” Fed. R. Evid. 702, CAN 2000; *see also Cook v. Rockwell Int’l Corp.*, 580 F. Supp. 2d 1071, 1083 (D. Colo. 2006) (citing *Robison v. Mo. Pac. R.R. Co.*, 16 F.3d 1083, 1090 (10th Cir. 1994)) (doubts about whether an expert’s testimony will be useful should generally be resolved in favor of admissibility unless there are strong factors favoring exclusion).

Dr. Carson’s Testimony is Relevant

KBR does not dispute that Dr. Carson’s testimony is relevant. Defs’ Mem. in Supp. at i. Relevant testimony logically advances material aspects of the proffering party’s case, is helpful to the finder of fact, and has a valid connection to the pertinent inquiry. *Daubert v. Merrell Dow Pharm. Inc.*, 43 F.3d 1311, 1315 (9th Cir. 1995); *see also Mukhtar v. Cal. State Univ., Hayward*, 299 F.3d 1053, 1063 n. 7 (9th Cir. 2002); *Primiano v. Cook*, 598 F.3d 558, 565 (9th Cir. 2010). As Dr. Carson’s testimony establishes causation, it is necessarily relevant.

Dr. Carson’s is Qualified

KBR also does not challenge Dr. Carson’s qualifications. Defs’ Mem. in Supp. at i. In addition to being a practicing physician in the area of occupational health and a toxicologist, Dr. Carson is the program director for Occupational and Environmental Medicine at the University of Texas Health Science Center. Pls’ Ex. 1, Carson Curriculum Vitae. Dr. Carson has several certifications and has authored several peer-reviewed publications related to occupational medicine. *Id.* Because Dr. Carson is abundantly qualified to render an opinion on the health effects of sodium dichromate, he satisfies the qualifications prong of Rule 702.

Dr. Carson's Testimony is Reliable

A court may consider five non-exhaustive factors to determine reliability: (1) Whether the expert's theory is generally accepted in the scientific community; (2) Whether the theory has been subjected to peer review; (3) Whether the theory can be tested; (4) Whether the rate of error is acceptable; and (5) Whether the expert is proposing to testify about matters growing naturally out of research. *Daubert*, 43 F.3d at 1316-17.

I. Dr. Carson Opines to Dose

KBR's concealment of the sodium dichromate hazard and spoliation prevented the Veterans from being monitored at the time of their exposure and, thus, from proving with mathematical precision the exact dose of their exposure. Not coincidentally, KBR now seeks to take advantage of its wrongdoing by asserting that Dr. Carson, along with any other expert in the world, cannot opine to dose. Defs' Mem. in Supp. at 2. Notwithstanding KBR's wrongdoing, however, its dose contentions are ill-founded.

Although KBR's spoliation prevented Dr. Carson from opining to dose with mathematical precision, he—like Dr. Gibb—is able to opine that the Veterans' exposure well exceeded the threshold necessary to cause their injuries. Documents relied upon by Dr. Carson support this opinion and provide:

- Based on visual observations, large areas of the eastern side of the WTP have been impacted by releases of aqueous solutions of Sodium Dichromate in and around the chemical injection building.

In addition, a sump, reported to have previously contained "orange water" was located in this area. KBR personnel reportedly pumped the orange water from this sump. Yellow stains are present on the walls of the sump.

Yellow stained soils extend outside the WTP fence. To the north of the intake canal on the eastern side of the WTP road, immediately south of the entrance gate on the east side of the WTP. Yellow crystalline material was observed on the walls and floors of the pump building located to the east of the chemical injection building.

- High levels of Chromium, Selenium, and Zinc have been determined. Chromium and Zinc were the resultants from use of chemicals Sodium Dichromate and Zinc Sulfate, for corrosion inhibitors. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. at 7; *see also* Pls' Ex. 4, Aug. 11, 2003 Lee Email.
- Visual assessments by KBR Construction and Environmental staff of surface soil outside of buildings within the WTP and areas outside the WTP fence have identified the following contaminated areas.

Yellow Stained Soil – Sodium Dichromate

- Adjacent to the chemical injection building and extending north and east to the WTP fence.
- Under the KBR office trailer and two SOC trailers.
- Under the thin gravel layer on the KBR office parking area and Halliburton office and equipment area.
- Adjacent to and extending approximately 50' west of the chemical injection building.
- North of the intake canal east of the WTP (200' x 200')
 - o Two orange-red stained areas were observed within this area suggesting the presence of crystalline Sodium dichromate.
- Any area covering 100' x 10' in an area south of the chlorination building and the east-west road on the south boundary of the facility.
- Cement drainage ditch extending from east side of chemical injection building to fence on east boundary of WTP.
- Unlined evaporation pond of approximately 3 acres located about 50' east of east fence.

One chemical storage building contains several broken bags of an orange material that appears to be pure sodium dichromate. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. pp. 7-8; *see also* Pls' Ex. 5, Aug. 3, 2003 Project Rio Qarmat Ali Rep.

- Around July realized that Sodium Dichromate was in more places than supposed to be, basically open to atmosphere, scattered all over the plant. Sodium Dichromate has penetrated the soil, dogged [sic] up to 4 feet and found Sodium Dichromate contamination. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 8; *see also* Pls' Ex. 6, Oct. 2, 2003 Meeting Min.

- Water Treatment Plant – We did a walk around in full PPE, we saw quite a bit of contaminated soil. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 8; *see also* Pls’ Ex. 7, Oct. 5, 2003 Bagnoche email.
- The toxic chemical had contaminated the entire plant. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 9; *see also* Pls’ Ex. 8 KBRs Self-Eval.

In addition to these documents, Dr. Carson’s opinion is buttressed with pictures of soldiers virtually standing on top of hundreds of open bags of sodium dichromate and the Veterans’ confirmation of being showered, unprotected with discolored dust and soil as it blew in the open wind. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 9; *see also* Pls’ Ex. 9, Photographs.

Onsite injuries and blood tests also led Dr. Carson to conclude that the Veterans’ exposure necessarily exceeded the threshold necessary to cause injury.

Documents relied upon by Dr. Carson support his opinion and provide:

- Almost 60% of people now exhibit symptoms. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 9; *see also* Pls’ Ex. 10, Aug. 8, 2003 Meeting Min.
- We began to have people come to us complaining that they had the symptoms listed on the MSDS for Sodium Dichromate. Several have stated that they have had very sore noses with some slight bleeding and others that describe “ulcers” in their noses. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 10; *see also* Pls’ Ex. 11, Aug. 25, 2003 VanOstrand email.
- We have received confirmation that our people have been exposed to the chromium at the WTP and some of the test results indicate they are at elevated levels (i.e. 117 Vs N < 10). Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 10; *see also* Pls’ Ex. 12, Sept. 9, 2003 Adams’ Email.
- While chrome results showed that level of blood Chrome is high, some people tested 4 times higher while others up to 14 times. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 10; Pls’ Ex. 13, Sept. 16, 2003 Meeting Min.
- KBR blood draws continue to show signs of Chromium VI staining. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 10; *see also* Pls’ Ex. 14, Sept. 26, 2003 Jerry Balcom email.

- Urine and blood sample showed elevated levels of Chromium meaning there was a significant exposure. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 10; *see also* Pls' Ex. 6, Oct. 2, 2003 Meeting Min.
- We have had a few (5) soldiers go on sick call for exposure to chemicals. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 11; *see also* Pls' Ex. 17, Sept. 17, 2003 Basra Water Treatment Plant Doc.
- Onsite medical personnel noticing that men stationed at Qarmat Ali were experiencing nosebleeds and breathing difficulties. Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 11; *see also* Pls' Ex. 18, Black Dep. pp. 22-23.

Based upon this evidence and interviews with Veterans, Dr. Carson opines:

Because of the extremely noxious nature of sodium dichromate and the obvious prevalence of . . . contamination at Qarmat Ali, it cannot be seriously disputed that the below-discussed symptoms typically associated with sodium dichromate exposure documented by National Guard and RAF Veterans were, in fact, to a reasonable degree of medical certainty caused by the extensive sodium dichromate contamination at Qarmat Ali and are demonstrative of an injury to the Veterans, including to their cellular DNA.

Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 9. KBR's contention that Dr. Carson did not account for dose is also contradicted by Dr. Carson's deposition testimony indicating that "I think dose does matter. It matters a great deal. But the fact that we can't specifically quantify the dose doesn't." Pls' Ex. 20, Carson March 28, 2010 Dep. p. 283. Dr. Carson further illustrates how dose factored in his opinion by stating:

QUESTION: You can't quantify that in any way, can you?

ANSWER: No.

QUESTION: It's just big?

ANSWER: It's just big.

QUESTION: You think that's a particularly scientific term?

ANSWER: No. It's common sense.

QUESTION: And it's big, as I understand it, whether you were there one hour, one hundred hours, on thousand hours, correct?

ANSWER: Yes. I think it's very likely to have been many orders of magnitude or much greater than historical industrial exposures.

QUESTION: On what are you basing that?

ANSWER: I'm basing it on the amount of contamination, the type of area it was, the fact that it was extremely dry most of the time, although it did rain occasionally; that it was very windy, that there were recurrence of windstorms periodically; and the predominance of acute irritative symptoms that the Guardsmen out there and the KBR personnel experienced.

Id. at 281; *see also id.* at 285. Dr. Carson's opinion that the Veterans' exposure well exceeded the threshold necessary to cause injury is, finally, supported by the opinion of Dr. Herman Gibb. Pls' Ex. 21, Gibb June 6, 2011 Rep. p. 26.

A. Individual Veterans

Although it acknowledges that Dr. Carson takes into account individual Veterans' time at Qarmat Ali, KBR asserts that Dr. Carson's opinion is defective because he does not consider where individual Veterans went while stationed at Qarmat Ali. Defs' Mem. in Supp. at 3. KBR's assertion that there might be "magic bubbles" at the open site where exposures would not occur is unsupported by either the factual record or any reasonable scientific evaluation. While addressing this argument during his deposition, however, Dr. Carson explained that "[p]retty much everybody told me they were all over the entire plant." Pls' Ex. 20, Carson March 28, 2010 Dep. p. 179. Dr. Carson further explains:

The weather information and the locations within the facility are useful information; but in my opinion that I still hold today, hexavalent chromium was throughout that facility, and there were very few places where it was not at a hazardous level that could have provided exposure.

Id. at 148. Dr. Carson's opinion not only negates KBR's assertion that he did not take into account location but is also corroborated by the Veterans' deposition testimony. *See e.g.* Pls' Ex. 22, Wilson Dep. p. 88; *see also* Pls' Ex. 23, Roberta Dep. pp. 66, 76-77; Pls' Ex. 24, Gentry Dep. p. 41; Pls' Ex. 25, Wilson Dep. pp. 63-64; Pls' Ex. 26, Wilczynski Dep. pp. 43-44, 50; Pls' Ex. 27, Crowley Dep. p. 45.

B. Case Law Contradicts KBR's Position

KBR cites *Lusch v. Matrixx Initiatives, Inc.*, 2007 WL 2816203 (D. Or. Sept. 25, 2007), in support of its contention that Dr. Carson must utilize a precise calculation of dose. Defs' Mem. in Supp. at 5-6. *Lusch*, however, does not indicate that an expert witness opine as to exact dose with the precision demanded by KBR. 2007 WL 2816203 * 4. Rather, *Lusch* indicates that an expert must demonstrate that a victim was subjected to "a dose sufficient enough" to cause the injury, and Dr. Carson makes this showing. *Id.*

Consistent with the fact that *Lusch* does not require a specific showing of dose, other cases from this district demonstrate that KBR's dose contentions are ill-founded. As provided by *McClellan*, "[l]ack of certainty is not, for a qualified expert, the same thing as guesswork." *McClellan*, 710 F. Supp. 2d at 1101. While precise information concerning the exposure necessary to cause harm is beneficial, such evidence is not always available, or necessary, to demonstrate that a substance is toxic. *Clausen v. M/V NEW CARISSA*, 339 F.3d 1049, 1059 (9th Cir. 2003) (quoting *Westberry v. GGAB*, 178 F.3d 257, 264 (4th Cir. 1999)); *Domingo v. T.K.*, 289 F.3d 600, 607 (9th Cir. 2002) ("While plaintiffs' experts cannot identify the precise threshold dose of bupivacaine or the length of exposure that triggers irreparable

chondrocyte damage, *Daubert* does not require that every aspect of a theory of medical causation be supported by research on the identical point”).

Other jurisdictions also conclude that precise dose is not necessary to establish causation. *Heller v. Shaw Indust., Inc.*, 167 F.3d 146, 157 (3rd Cir. 1999) (“[E]ven absent hard evidence of the level of exposure to the chemical in question, a medical expert could offer an opinion that the chemical caused plaintiff’s illness.”); *Wright v. Willamette Indus., Inc.*, 91 F.3d 1105, 1107 (8th Cir. 1996) (plaintiffs need not show a “mathematically precise table equating levels of exposure with levels of harm.”); *In re Avandia Mktg., Sales Prac. & Prod. Liab. Litig.*, 2011 WL 13576 (E.D.Pa. Jan. 4, 2011) (denying motion to exclude plaintiffs’ experts’ opinion about causal connection without discussion of toxic dose); *Bartlett v. Mut. Pharm. Co., Inc.*, 760 F. Supp. 2d 220 (D.N.H. 2011) (plaintiff presented sufficient evidence that drug’s risks outweighed its benefits without discussion of dose); *In re Fosamax Prod. Liab. Litig.*, 645 F. Supp. 2d 164 (S.D.N.Y. 2009) (denying motion to exclude plaintiffs’ experts’ opinion that drug can cause osteonecrosis of the jaw without requiring demonstration of dose); *In re Neurontin Mktg., Sales Prac., & Prod. Liab. Litig.*, 612 F. Supp. 2d 116 (D. Mass. 2009) (denying motion to exclude plaintiffs’ experts’ opinion that Neurontin can increase risk of suicide without determination of dose-response relationship); *In re: Zicam Cold Remedy Mktg., Sales Prac., & Prod. Liab. Litig.*, 797 F. Supp. 2d 940, 946 (D. Ariz. 2011) (“to establish general causation, plaintiffs need not prove a toxic dosage of Zicam. Instead, plaintiffs must demonstrate Zicam “is toxic to humans given substantial exposure” and may do so with qualitative rather than quantitative analysis).

C. KBR's Spoliation also Constitutes Evidence of Harmful Dosage

KBR's spoliation should also be considered while weighing KBR's attempted challenge in light of the fact that "*Daubert* counsels against rigid formulations of reliability and, instead, requires the court to carefully examine plaintiffs' experts' methodologies as applied to the specific facts presented." *McClellan*, 710 F. Supp. 2d at 1138 (citing *In re Ephedra Prod. Liab. Litig.*, 393 F. Supp. 2d 181, 193 (S.D.N.Y. 2005)). A federal court has the inherent discretionary power to make appropriate evidentiary rulings in response to the destruction of evidence. *Glover v. BIC Corp.*, 6 F.3d 1318, 1329 (9th Cir. 1993). Included within this power is the ability to permit a jury to draw an adverse inference from the spoliation of evidence. *Akiona v. U.S.*, 938 F.2d 158, 160-62 (9th Cir. 1991); *see also Brodle v. Lockmend Farms, Inc.*, 2011 WL 4913657 (D. Or. Oct. 13, 2011). Although bad faith can establish spoliation, knowledge that actions will influence future litigation is sufficient. *Pirv v. Glock, Inc.*, 2009 WL 54466 (D. Or. Jan. 8, 2009); *Leon v. IDX Sys. Corp.*, 464 F.3d 951, 959 (9th Cir. 2006).

KBR committed spoliation by failing to convey its knowledge of sodium dichromate contamination while soldiers were exposed thereto for several months and encapsulating Qarmat Ali immediately upon notifying the USACE of the hazard. These two acts had the practical effect of preventing soldiers from being tested before remediation skewed test results, as sodium dichromate flushes through the body and becomes untraceable fairly quickly. Pls' Ex.2, Carson Nov. 8, 2011 Rep. pp. 12-13. Had it not been for KBR's spoliation, the Veterans would have been able to establish dose with mathematical precision.

1. KBR had a Duty to Warn

KBR had a duty to alert the Army of hazards. Pls' Ex. 28, Remington Dep. p. 146. As demonstrated by it March 31, 2003 SITREP, KBR was well aware of this duty:

Per USACE SWD, if KBR is ever prevented from executing its mission due to a "non-benign" environment, KBR is to report the condition to the Client to ensure appropriate steps are taken to restore the benign environment.

Pls' Ex. 29, March 31, 2003 SITREP § 3; Pls' Ex. 30, Stephenson Dep. pp. 42-43 (this duty extends to environmental hazards).

2. KBR Knew of the Danger

Despite its failure to alert the USACE of the sodium dichromate hazard until August 8, 2003, KBR was well aware of this hazard before an American soldier ever set foot on Qarmat Ali's sodium dichromate contaminated soil. *See* Pls' Mot. to Compel and for Sanctions, Doc No. 287. As further explained by KBR's senior environmental manager Ralph Stephenson:

QUESTION: Very basic question: Can you confirm for us that you, corporate headquarters, KBR, Houston, Texas, knew before any assessment was done by Mr. Tseng on the ground, there was sodium dichromate out there?

ANSWER: I'm quite certain of it.

Pls' Ex. 30, Stephenson Dep. pp. 72-73, 93. As demonstrated by Chuck Adams' May 27, 2003 email noting the presence of chemical hazards and Rod Kimbro's June 21, 2003 email warning KBR of the contamination, KBR was also aware of the fact that sodium dichromate had contaminated large portions of Qarmat Ali. Pls' Ex. 65, Adams May 27, 2003 Email; Pls' Ex. 31, June 21, 2003 Kimbro email.

3. KBR Concealed its Knowledge

KBR concealed its knowledge of the sodium dichromate contamination. As concluded by the Inspector General:

Contractor recognition of, and response to, the health hazard represented by sodium dichromate contamination, once identified at the Qarmat Ali facility, was delayed. The delay occurred because KBR did not fully comply with occupational safety and health standards required by the contract.

Pls' Ex. 32, DODIG Rep., Part II, p. i. Consistent with the Inspector General's conclusion, USACE Contract Officer Cheryl Hodge-Snead indicated that she did not recall a single project manager informing her that there was a hazard at Qarmat Ali prior to August 8, 2003. Pls' Ex. 33, Hodge-Snead Dep., pp. 65-71; *see also* Pls' Ex. 66, Weatherly Dep. pp. 112-14.

KBR was presented with numerous opportunities wherein it could and should have alerted the military of the sodium dichromate hazard. For example, Adams—who was aware of the hazard in May—participated in regular meetings with the USACE wherein potential hazards were supposed to be disclosed. Pls' Ex. 34, Adams Dep. pp. 15-17. Similarly, despite the fact that it has sections designated “Safety Report” and “Environmental Report,” KBR's July 8, 2003 Qarmat Ali Assessment fails to mention the contamination. Pls' Ex. 35, Qarmat Ali Assessment Rep., Table of Contents.

KBR also had an opportunity and obligation to inform the Veterans. In KBR's June 21, 2003 SITREP—the day KBR was admonished of the danger by Kimbro—KBR notes, “Water Treatment Project's Day Crew rendezvous with ‘shooters.’ Day crew arrived to WTP, held safety meeting.” Pls' Ex. 36, KBR June

21, 2003 SITREP § 6.1.2.1.1. General Crear speaks of the importance of KBR's obligation to warn soldiers of known hazards during these safety meetings:

QUESTION: How important is it if KBR had information about a threat at a work site, it should be shared at these meetings.

ANSWER: Yeah, it should certainly be shared, no doubt.

Pls' Ex. 37, Crear Dep., pp. 48-49, 143; *see also* Pls' Ex. 38, Gentry Dep., p. 62 (it is incumbent upon individuals at safety meetings to alert of chemical hazards). As stated by the now-deceased Lt. Col. James Gentry of KBR's ability and obligation to warn of the sodium dichromate hazard:

QUESTION: How easy was it for any human being at KBR at any point, May, June, July, August—

ANSWER: They had a soldier right beside them. They could always – there's always a platoon leader out there every day on the site, and that rotated, and a platoon sergeant. Those two knew how to get a hold of me.

QUESTION: Disappointing to you? KBR, disappointing at all?

ANSWER: Very disappointing. They had this information and didn't share it.

QUESTION: Why?

ANSWER: I'm dying now because of it.

Pls' Ex. 39, Gentry Dep. pp. 24-25.

4. KBR's Misrepresentations

KBR also made affirmative misrepresentations that contributed to spoliation. For example, when one Veteran asked KBR what all of the orange powder at Qarmat Ali was, he was informed, "it's nothing. If anything, it's a mild irritant" and that "[y]ou'd pretty much have to bathe in the stuff for it to harm you." *See e.g.* Pls'

Ex. 40, Kimberling Dep. pp. 60, 64; *see also* Pls' Ex. 50, Arnold Dep. p. 55; Pls' Ex. 51, Rosgen Dep. p. 75; Pls' Ex. 52, Stanger Dep. pp. 98-99.

Similarly, in a particularly disturbing misrepresentation, KBR manager Young Lee states in an August 15, 2003 email:

As I mentioned to you, Army Staff Sgt. Hamilton . . . was concerned about the contamination and wanted to know all facts such as PPE, soil and air test results, and personnel monitoring programs to protect soldiers at the water treatment plant.

Pls' Ex. 42, Lee Aug. 15, 2003 email. Despite the fact that Lee had attended a meeting just seven days earlier wherein it was noted "almost 60% of the people now exhibit symptoms" and Lee's knowledge that soldiers were still stationed at Qarmat Ali, Lee responded to Staff Sergeant Hamilton's request by noting, "I told him that test results were preliminary and could not be provided until the final results are confirmed." Pls' Ex. 10, Aug. 8, 2003 Meeting Min. Moreover, despite Lee's representation that it was not yet known whether PPE was required, KBR managers donned full Tyvek suits when they inspected Qarmat Ali shortly thereafter. Pls' Ex. 24, Gentry Dep. p. 44.

KBR also spoiled evidence by preventing its employees from alerting the Army of the sodium dichromate hazard. When KBR's safety officer Edward Blacke ("Blacke") arrived at Qarmat Ali, he began to notice nose bleeds and other signs of sodium dichromate exposure. Pls' Ex. 18, Blacke Dep., pp. 17, 22-23. When Blacke raised this issue, Adams informed him that there was no problem. *Id.* pp. 34-35. During a subsequent meeting with onsite workers, when Blacke heard KBR informing people that there was no health concern, Blacke interjected and indicated

that sodium dichromate is a substantial health concern and further attempted to inform the Army thereof. *Id.* at 37, 44. Because of his actions, Blacke was fired. *Id.* at 6; *see also* Pls' Ex. 43, Rea Dep., p. 45.

5. KBR Finally Alerts the USACE

On August 12, 2003, KBR sent Hodge-Snead a letter stating in part:

This notice is to advise the USACE of the compelling and urgent situation. It is our plan to immediately procure a contractor, materials and means to encapsulate the soils in question and any necessary surrounding areas at the Qarmat Ali Water treatment facility.

Pls' Ex. 44, Aug. 12, 2003 Hodge-Snead Letter. As demonstrated by this letter, KBR simultaneously alerted the USACE of the "compelling and urgent" situation that it had known about for months and, immediately, began remediating the contamination—thus, preventing testing to reveal the dose of sodium dichromate to which onsite personnel were exposed.

Had KBR fulfilled its obligation of timely alerting the USACE, the USACE would have performed tests that would have revealed the soldiers' exposure. As stated by General Crear:

QUESTION: As soon as you, in any way, got information indicating exposure, danger to soldiers, civilians on site what would you have done?

ANSWER: Red flag.

QUESTION: Meaning?

ANSWER: We stop. Make an assessment.

Pls' Ex. 37, Crear Dep., p. 18; *see also* Pls' Ex. 28, Remington Dep. p. 221 ("I think we would have initiated medical monitoring right away"). The results of such tests would have allowed the Veterans to establish dose with mathematical precision.

6. *KBR's Post-Notification Spoliation*

KBR compounded its spoliation by testing on-site workers for *chromium* despite KBR's knowledge that such a test would not disclose *sodium dichromate* exposure. Pls' Ex. 45, Conte Dep. pp. 24-27. As demonstrated by the below quote, this inaccuracy was done for a litigation purpose:

Sudhir . . . why are we referring to Chromium VI . . . the analysis was for Total Chromium under NIOSH 7300. As I mentioned in the voicemail I left you on Monday, we need to refer to Total Chromium and not Chromium VI . . . we must be careful from a litigation standpoint how we address the chemicals.

Pls' Ex. 46, Sept. 3, 2003 Keyston email; *see also* Pls' Ex. 47, Sept. 16, 2003 Fletcher email ("Dr. Conte and Mr. Bedlam [sic, maybe] from Legal are handling the issue and we don't need to discuss theory in public").

KBR's spoliation efforts are best summarized by its statement of, "under the circumstances of potential litigation, I believe we did all we could do to control it." Pls' Ex. 49, March 2, 2005 Dellinger email. The doctrine of spoliation does not allow KBR to reap the benefits of "doing all it could do to control it," and this Court should, therefore, deny KBR's Motion to Exclude premised upon its contention that Dr. Carson does not account for dose with mathematical precision.

D. *Burleson*

KBR contends that Dr. Carson's opinion is inadmissible because the Fifth Circuit rejected a prior opinion of his in *Burleson v. Tex. Dep't of Crim. Justice*, 393 F.3d 577 (5th Cir. 2004). Defs' Mem. in Supp. at 6-7. In *Burleson*, prisoners in a state penitentiary worked as welders without being informed that the thoriated tungsten steel welding electrodes given to them were radioactive. 393 F.3d 581-82.

Burleson, *pro se*—along with four of his fellow inmates who worked with the welding material—contracted cancer, and the State of Texas Department of Corrections challenged the opinion that Burleson’s cancer was caused by his exposure. *Id.* Although it acknowledged that Dr. Carson was “a well-credentialed toxicologist and expert in occupational medicine,” the Fifth Circuit rejected Dr. Carson’s conclusion because there were no studies that demonstrate a statistically significant link between thorium dioxide and Burleson’s type of cancer and Dr. Carson did not perform a dose assessment. *Id.* at 585-86.

There are two factors that distinguish Dr. Carson’s opinion that he gave on behalf of Burleson with the opinion he is now offering. First, in sharp contrast to thoriated tungsten at issue in *Burleson*, it is beyond dispute that sodium dichromate is a carcinogen and causes numerous maladies. In fact, KBR’s experts admit that sodium dichromate is capable of causing many of the maladies actually sustained by the Veterans. *See e.g.* Pls’ Ex. 53, Beck Dep. pp. 109, 131-133, 136. Second, in contrast to the evaluation in *Burleson* that was premised only upon a potential “hot spot” theory, ample evidence indicates that the on-site Veterans’ exposure exceeded the threshold necessary to cause their injuries.

II. Medical Records were Evaluated with Due Care

KBR asserts that Dr. Carson’s opinion should be rejected because his review of medical records was “cursory and haphazard.” Defs’ Mem. in Supp. at 7. KBR’s presentation of evidence in support of this assertion is not only inaccurate but is just flat wrong and clearly misleading.

For example, KBR asserts that “Carson went ahead and opined in June 2011 that plaintiffs had numerous injuries due to chromium exposure even though he had not reviewed all of the medical records.” *Id.* at 7. KBR cannot have it both ways. KBR moved for sanctions premised upon its insistence that Dr. Carson had not offered an opinion as to causation in his June 2011 Report. *See* Defs’ Mem. in Supp. of FRCP 56(b) p. 12-17, Doc No. 205 (“he did not actually offer an opinion on the cause of any particular alleged injury”). The Veterans did not challenge this contention, and Dr. Carson informed KBR that he did not offer an opinion on causation in his June 2011 Report because he had not at that time completed his differential diagnosis. Pls’ Ex. 20, Carson Dep. p. 122. For this reason, KBR’s medical records contention should be rejected.

In an equally inaccurate statement, KBR contends that Dr. Carson did not review medical records and simply “threw them in the corner.” Defs’ Mem. in Supp. at 7. KBR’s quote of Dr. Carson’s testimony omits his immediately following statement of, “[w]hen I was able to spend time going through medical records, I went through them individually and looked for information regarding the individual plaintiffs.” Pls’ Ex. 20, Carson Dep. p. 13. KBR also fails to alert the Court that Dr. Carson reviewed all of the medical records that he was provided and considered this review to be important to his conclusions. *Id.* at 71, 99, 220; *see also* Pls’ Ex. 54, Carson May 7, 2012 Dep. pp. 14, 22.

Finally, in asserting that Dr. Carson “still had not reviewed all of the medical records,” KBR fails to alert the Court that Dr. Carson has reviewed all medical records in his possession but still receives two or three deliveries of medical records

every week from KBR's chosen vendor. Pls' Ex. 20, Carson Dep. p. 74. Dr. Carson cannot be faulted for not reviewing records he was not provided.

III. Dr. Carson Complied with KBR's Agreement

In a similar argument, KBR faults Dr. Carson for showing "up at his deposition unprepared to testify specifically about particular plaintiff's causation or injury." Defs' Mem. in Supp. at 8-9 (citing *Claar v. Burlington N. R.R. Co.*, 29 F.3d 499, 502 (9th Cir. 1994)). Despite supporting this assertion with its signature bombastic flair of "enough already," KBR fails to alert the Court of the parties' agreement that Dr. Carson's deposition was limited to general methodology. KBR memorializes this agreement during Dr. Carson's deposition by noting:

But this is without prejudice through our prior agreement that this – that the last time's depo and today's depo was on your general methodology and I reserve our rights to take individual specific depositions in the future.

Pls' Ex. 54, Carson May 7, 2012 Dep. p. 523; *see also* Pls' Ex. 55, April 5, 2012 Peacock email ("This is also without limitation to our taking Carson's deposition in the future on individual plaintiffs as we have previously discussed and agreed"). The Veterans are at a loss as to how KBR can assert that Dr. Carson's opinion should be stricken because he complied with KBR's agreement.

IV. Evidence was Fully and Fairly Evaluated

KBR asserts that Dr. Carson's testimony is defective because he did not review the Veterans' depositions and "did absolutely nothing to confirm the reliability of what plaintiffs' told him." Defs' Mem. in Supp. at 10-11. KBR's assertion grossly inflates the significance of deposition review to a medical expert

providing a clinical evaluation. After reviewing instances wherein deposition testimony might impact Dr. Carson's clinical evaluation of a specific Veteran, KBR's attorney sums up the difference made by deposition review:

ANSWER: I don't expect their sworn testimony to be different from what they told me.

QUESTION: You've seen two instances now where it is.

ANSWER: Okay. Out of – that's about 1 percent so far, correct? More than 1 percent.

ANSWER: Yes.

QUESTION: Okay. And you don't think that's significant?

ANSWER: I think it's significant, but it's not something I'm expecting to be routine.

Pls' Ex. 20, Carson Dep. p. 293. As demonstrated by KBR's attorney's observation that the rate of unreliability associated with deposition review is just over one percent, KBR's contention attempts to impose a requirement that far exceeds the strictures of *Daubert*.

Of equal importance, KBR's assertion that Dr. Carson did "absolutely nothing" to confirm the reliability of what the Veterans told him is inaccurate. Dr. Carson reviewed the Veterans' post-deployment health assessments, found them to be largely consistent with the Veterans' representations, and changed his opinion five or six times as a result of this review. *Id.* at 103, 105-06, 197. This review not only demonstrates the ill-found nature of KBR's contention that Dr. Carson did "absolutely nothing" to confirm the reliability of what the Veterans told him but also demonstrates the inaccuracy of KBR's contention that Dr. Carson "declined to

change his opinion even when it was based on information that was contradicted by what the plaintiffs told Army much closer in time.” *Id.*

V. Sodium Dichromate can Cause the Veterans’ Maladies

KBR also asserts that no clinical medical evaluation can be proffered unless it constitutes an epidemiological study. Defs’ Mem. in Supp. at 12-20 (citing *Cloud v. Pfizer*, 198 F. Supp. 2d 1118 (D. Az. 2001)). This is neither a required standard, nor can be imposed upon a qualified expert who may reasonably confirm causation by way of a differential diagnosis reached using clinical methodologies. Pls’ Ex. 20, Carson Dep. p. 164; *see also Clausen*, 339 F.3d at 1060 (quoting *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 262 (4th Cir. 1999)) (“a reliable differential diagnosis alone may provide a valid foundation for a causation opinion, even when no epidemiological studies, or laboratory data are offered in support of the opinion”).

Furthermore, as even admitted by KBR’s expert, there is an abundance of scientific literature that confirms that sodium dichromate cause multitudes of the Veterans’ injuries. Pls’ Ex. 53, Beck Dep. pp. 109, 131-133, 136. Consistent with KBR’s expert’s opinion, Dr. Carson provided KBR with a malady-specific list of authorities that support his opinion. Pls’ Exs. 56-58, Carson Authority List. For this reason, KBR is incorrect in its assertion that Dr. Carson cannot “show a plausible link between disease and exposure.” Defs’ Mem. in Supp. at 16 (citing *Avila v. Willits Env’tl Remediation Trust*, 633 F.3d 828, 840 (9th Cir. 2011)).

In a related argument, KBR asserts that Dr. Carson attempts to sidestep the requirement of linking exposure to a specific illness by only opining to extremely general maladies. Defs’ Mem. in Supp. at 17 (citing *Casey v. Ohio Med. Prods.*, 877

F. Supp. 1380, 1385 (N.D. Cal. 1995)). Dr. Carson's opinion is much more specific than KBR would lead the Court to believe.

For example, Dr. Carson opines that Veteran Dennis Jewell suffers illnesses to his lower respiratory system as a result of his exposure. Pls' Ex. 2, Carson Nov. 8 Rep. p. 19 § S. Had Dr. Carson limited his opinion to such a statement, KBR would be correct in its assertion that Dr. Carson's identification of illnesses is vague. In his June 7, 2011 Report, however, Dr. Carson includes several pages further specifying Mr. Jewell's illnesses. Pls' Ex. 59, Carson Jewell Rep. Therein, Dr. Carson lists a "review of systems" wherein specific illnesses are circled. *Id.* As Dr. Carson informed KBR, the circling of various maladies alerts KBR of the specific illness a Veteran is suffering from. Pls Ex. 54, Carson May 7, 2012 Dep. p. 70; *see also id.* at 75, 80.

Finally, KBR asserts that Dr. Gibb's groundbreaking study that set the OSHA PEL is not probative in this case because the Veterans "allege they were exposed to sodium dichromate which is different from the hexavalent chromium at issue in Gibb's Baltimore study." Defs' Mem. in Supp. at 20. The Veterans are, again, at a loss for the basis of KBR's contention, as sodium dichromate was the primary chemical that formed the basis of Dr. Gibb's study. Pls' Ex. 60, Gibb Aff. Consistent with KBR's misrepresentation, it cannot seriously be questioned that there is an abundance of scientific literature supporting medical causation.

VI. Dr. Carson Performed a Proper Differential Diagnosis

KBR contends that Dr. Carson did not perform a proper differential diagnosis because he failed to rule out other possible causes for the Veterans' maladies. Defs'

Mem. in Supp. at 21-25 (citing *Hall v. Baxter Healthcare Corp.*, 947 F.Supp. 1387, 1414 (D. Or. 1996)).¹ In his Report, however, Dr. Carson outlines his differential diagnosis by noting:

These examinations, interviews, and lab workups as well as my review of medical records follow a generally-accepted methodology in occupational medicine, wherein a differential diagnosis is used to establish the correct diagnosis and focus on its cause.

Pls' Ex. 2, Carson Nov. 8, 2011 Rep. p. 2. Dr. Carson further elaborates on the methodology employed by his differential diagnosis during his deposition. Pls' Ex. 20, Carson Dep. pp. 118, 245-47.

In a related argument, KBR complains that not all aspects of Dr. Carson's differential diagnosis are included in his Report and it is required to ask Dr. Carson about some of the aspects of his differential diagnosis. Defs' Mem. in Supp. at 21-22. This is neither reasonable nor consistent with generally accepted clinical methodologies. For example, despite KBR's complaint KBR's causation expert report contains considerably less analysis than that contained in Dr. Carson's Report. For example, after listing Jason Arnold's symptoms, KBR's causation expert, Dr. Weill, includes an analysis section that provides:

Mr. Arnold only reported having nosebleeds while serving in Iraq in 2009, years after the fact and has never suffered from such ailment upon returning to the United States. There is no medical basis to link Mr. Arnold's claimed symptoms related to asthma to any alleged exposure to sodium dichromate, and there is no medical basis to support an allegation that exposure to sodium dichromate actually or even probably caused Mr. Arnold's claimed symptoms. Please see section 2A of my general report.

¹ KBR also asserts that Dr. Carson's differential diagnosis is deficient because it did not specify an exact dose for each Veteran. *Id.* at 23. The Veterans demonstrate the impropriety of KBR's dose-based contentions in Section I of this Response.

Pls' Ex. 61, Weill Arnold Report pp. 8-9. Nowhere in Dr. Weill's Report does Dr. Weill indicate that Mr. Arnold's individual symptoms are caused by another source or indicate why he believes that sodium dichromate is not the cause of Mr. Arnold's injuries. Pls' Ex. 62, Weill Nov. 15, 2011 Rep. p. 12.

Dr. Weill's explanation for his lack of analysis makes it very clear why KBR's claim is unfounded and why the level of detail required by KBR is impractical:

QUESTION: What you just told me is you can't say that just because you're not able to exclude emphysema doesn't mean emphysema is, quote, unquote, a hundred percent the cause. Is that what you just told me, correct?

ANSWER: Right

QUESTION: But you have at least have to address that, right?

ANSWER: You have to address everything. That's why the reports are eight pages – or in this case nine pages long.

QUESTION: And I'm trying to determine where in the report you do that?

ANSWER: Well, I do it in my head. I don't write down a differential diagnosis and say, well, I excluded lung cancer because of X, Y, and Z. . . . We would run out of paper if we did that.

Pls' Ex. 63, Weill Dep. p. 109; *see also* Weill Dep. pp. 96-102. As explained by KBR's expert of the reason that he did not specifically delineate the diagnosis that he "did in his head," the level of detail sought by KBR is impractical and does not constitute a basis for exclusion.

Finally, KBR has deposed Dr. Carson for eleven hours and will depose him again for trial depositions. KBR's ability to depose Dr. Carson further speaks to the unfounded nature of KBR's insistence that Dr. Carson provide a level of detail in his report that KBR's own expert believes would cause the expert "to run out of paper."

See Kennedy v. Collagen Corp., 161 F.3d 1226, 1230 (9th Cir. 1998) (“Dr. Spindler set forth the steps he took in arriving at his conclusion in his deposition.”); *see also McClellan*, 710 F. Supp. 2d at 1115 n.14 (finding no prejudice to defendants sufficient to warrant exclusion despite any infirmity in an expert’s report in the face of numerous lengthy and comprehensive depositions of plaintiffs’ experts).

VII. Dr. Carson Addresses CHPPM

KBR, lastly, contends that Dr. Carson’s opinion should be excluded because it does not consider the CHPPM Report. Defs’ Mem. in Supp. at 23. As it always does when it invokes CHPPM, however, KBR fails to alert the Court that CHPPM places “low confidence” in its conclusions because they were formed after KBR encapsulated the sodium dichromate contamination. Pls’ Ex. 64, CHPPM Rep. pp. i. § 2(c), 29. Moreover, Dr. Carson devotes five pages of his Report to addressing why CHPPM was correct in ascribing low confidence to its conclusions. Pls’ Ex. 2, Carson Nov. 8, 2011 Rep. p. 24-28.

Conclusion

For all of the above-stated reasons, the Veterans ask this Court to deny KBR’s Motion to Exclude the expert testimony of Dr. Carson re Causation.

Respectfully submitted,

Dated this 18th Day of May, 2012

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CERTIFICATE OF COMPLIANCE

This Response complies with the applicable word-count limitation under Local Rule 7-2(b), 26-3(b), 54-1(c), or 54-3(e) because it contains 7199 words, including headings, footnotes, and quotations, but excluding the caption, table of contents, table of authorities, signature block, and any certificates of counsel.

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CERTIFICATE OF SERVICE

I hereby certify that I served the foregoing on the following persons on this same day by hand delivery, by facsimile transmission, by electronic mail, or by enclosing a copy in an envelope, properly addressed and with first-class postage, and placing in the mail on this 18th day of May 2012.

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